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Patent claims

1. Expansion lance assembly for the partial expansion of a a straight-running tubular hollow profile by exerting a fluidic high internal pressure, with a rod-shaped seal carrier detachably attached to a carrier holder, with a sealing arrangement which comprises at least two sealing rings formed with oversize at the outside diameter with respect to the inside diameter of the hollow profile and at least one spacer sleeve placed between the pair of sealing rings and the carrier holder and is arranged on the seal carrier, which has an axial inflow bore connected to a fluid high-pressure source and at least one transverse bore branching off from the inflow bore and opening out between the pair of sealing rings, and with an axial end support of the sealing arrangement remote from the holder, characterized in that the sealing rings (8) in each case comprise two components, the first component being formed by a low-abrasion high-pressure-resistant elastomer ring (19), which bears against the circumferential surface (5) of the seal carrier (2) in such a way that it can be elastically deformed axially by the high internal pressure, and the second component being formed by a high-pressure-resistant supporting ring (28), which is radially elastic and axially has a very high tensile strength, and in that the elastomer ring (19) has on its side (14) facing away from the nearest transverse bore (4) a peripheral shoulder (37), on which the supporting ring (28) is mounted and which is enclosed by the supporting ring (28), the seal carrier (2) and an axial stop (9) arranged on the latter.

2. Expansion lance according to Claim 1, characterized in that the elastomer ring (19) consists of a hydrolysis-resistant thermoplastic polyurethane elastomer.

3. Expansion lance according to Claim 1, characterized in that the supporting ring (28) consists of a linear aromatic polymer or a polyoxymethylene thermoplastic.

4. Expansion lance according to Claim 1, characterized in that the axial stop is formed by a spacer sleeve (9), which is arranged with a snug fit on the seal carrier (2).

5. Expansion lance according to Claim 1, characterized in that the spacer sleeve (9) is axially supported on its side facing away from the sealing ring against a positioning stop (11) axially fixed on the seal carrier (2).

6. Expansion lance according to Claim 5, characterized in that the positioning stop (11) comprises two ring halves (15, 16), which are accommodated in an annular groove (17) of the seal carrier (2) to form a full ring, and protrude radially out of the annular groove (32), being held together at their circumference by an elastomeric ring (18).

7. Expansion lance according to Claim 1, characterized in that the elastomer ring (19) has a peripheral sealing lip (20) which protrudes radially outwards from its outer circumference and has a much greater outside diameter than the inside diameter of the hollow profile to be expanded.

8. Expansion lance according to Claim 7, characterized in that the radially outwardly protruding sealing

lips (20) of the two sealing rings (8) of the pair of sealing rings are inclined towards each other.

9. Expansion lance according to Claim 7, characterized in that the sealing lip (20) of the trailing sealing ring (8) of the pair of sealing rings in the pushing-in direction of the expansion lance (1) has on the side of the sealing ring (8) ahead of it a peripherally chamfered radially outward-facing bevel (21).

10. Expansion lance according to Claim 7, characterized in that the elastomer ring (19) has on its side facing away from the supporting ring (28) a circumferential groove (22), which is open in the axial direction and the upper flank of which forms the underside (23) of the sealing lip (20).

11. Expansion lance according to Claim 10, characterized in that the groove (22) is between 2 and 2.3 mm deep.

12. Expansion lance according to Claim 10, characterized in that the groove (22) is of a notch-shaped form, the groove base (24) being rounded.

13. Expansion lance according to Claim 1, characterized in that the elastomer ring (19) has a peripheral sealing lip (25) which protrudes radially inwards from its inner circumference and bears against the seal carrier (2) with prestress.

14. Expansion lance according to Claim 13, characterized in that the radially inwardly protruding sealing lips (25) of the two sealing rings (8) of the pair of sealing rings are inclined towards each other.

15. Expansion lance according to Claim 13, characterized in that the sealing lip (25) of the trailing sealing ring (8) of the pair of sealing rings in the pushing-in direction of the expansion lance (1) has on the side of the sealing ring (8) ahead of it a peripherally chamfered radially inward-facing bevel (26).

16. Expansion lance according to Claim 13, characterized in that a flexible stripping ring (31), which has a greater diameter than the inside diameter of the hollow profile, is attached onto the seal carrier (2), ahead of the sealing arrangement (7) in the pushing-in direction of the expansion lance (1).

17. Expansion lance according to Claim 1, characterized in that the seal carrier (2) consists of a hardened and tempered steel.